

VEGETABLE CROPS HOTLINE

A newsletter for commercial vegetable growers prepared by the
Purdue University Cooperative Extension Service

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PHYTOPHTHORA BLIGHT - (Dan Egel) - Although much of the state has been very dry, locally heavy rains may increase the severity of Phytophthora blight of pumpkin.

Often the symptom one notices of this disease is the appearance of clusters of rotting fruit in the field. The outbreaks are almost always in low-lying areas in the field where plant surfaces tend to remain wet for extended periods of time whether the moisture is in the form of rain or dew. Pumpkins in areas of the field where water tends to stand are especially likely to become infected.



Figure 1: Phytophthora blight of pumpkin can be recognized by the white, fluffy fungus that grows on the fruit. (Photo by Dan Egel)

Pumpkin fruit are especially prone to infection at the top of the pumpkin, close to where the fruit is attached to the stem. The depression in the fruit surrounding the stem attachment serves as a reservoir for moisture and provides a very favorable setting for infection by spores of the Phytophthora fungus (Figure 1). The spores can be produced on other parts of the plant or on fruit of other plants (the fluffy white mold associated with the fruit rot contains millions of spores!). Fusarium fruit rot of pumpkin has a similar appearance.

Management options-Avoid poorly drained fields, especially those with a history of the disease. The use of raised beds can help control this disease in some crops. Limit irrigation as much as possible. Fumigation has been effective in some cases.

Reservoirs or rivers can be contaminated with Phytophthora from the run off of nearby fields. If such waters are used for overhead irrigation, Phytophthora blight may result.

Fungicides can be used to lessen the impact of Phytophthora infection, but it is an uphill battle. Contact fungicides may offer moderate protection if used as part of a season long program against Phytophthora blight and other diseases. Contact fungicides include chlorothalonil (e.g., Bravo, Echo, Equus) and maneb (e.g., Maneb 75 DF, Manex). However, systemic fungicides will have more impact against this disease. Systemic fungicides include dimethomorph (e.g., Acrobat, Forum) and cyazofamid (Ranman). No fungicide will provide adequate control without also using the cultural controls discussed here.

Phytophthora blight is difficult to deal with, and must be managed with all available resources over a period of time. Avoid fields with a history of the problem. Do everything you can to avoid an early season outbreak that may jeopardize your other crops, and don't rely only on fungicides for control. In some cases, it may make sense to plow under a field or part of a field with Phytophthora blight to protect nearby fields.

SOYBEAN APHIDS AND PUMPKIN VIRUSES - (Rick Foster and Dan Egel) - As usually happens this time of year, we are starting to see virus diseases show up in pumpkin fields. If pumpkins have set fruit before infection occurs, then there will be little effect on yield or quality. That is why we recommend planting as early as your market

allows. We have observed that pumpkin viruses seem to be more common in northern Indiana than in the southern part of the state. In all likelihood, this is because soybean aphids are more common in the north. Soybean aphids are one of the unusual insects that overwinter in the north and migrate south.

A reasonable question would be: Why are soybean aphids transmitting viruses to pumpkins? That is a really good question because soybean aphids don't like pumpkins and will not feed on or colonize pumpkins. However, the behavior of the aphid can explain the cause of the problem. Winged aphids are not very good fliers and don't have very good eye sight. Their movement is often dictated by the direction of the wind and they will drop down into any field to see if it is a suitable crop, soybeans. Whatever plant they land on, they will take a test bite, and if they like it they will stay, but if not, they will fly away. If that plant happens to be a virus infected plant, the test bite is enough for them to get the virus on their mouthparts. When they fly away, if the next field they land in is a pumpkin field, then taking a test bite will transmit the virus to the pumpkin plant and infection will occur. The aphid won't stay in the field, but the damage is already done.

Soybean aphids have been moderately high this year, high enough to cause some problems in pumpkins. Unfortunately, there is little you can do to avoid the problem other than plant early. If that aphid was killed by an insecticide as soon as she took her test bite, the plant would still be infected with the virus. The only possible advantage of using insecticides would be to stop secondary infection within your field, and most entomologists don't think that is worthwhile.

BEWARE OF CORN EARWORMS - (*Rick Foster*) - Over the past 9 nights, we have caught extremely high numbers of corn earworm moths in our pheromone traps. On August 15, we had 459 moths in our trap in Lafayette and this morning (August 21) we had 346 moths. Remember that we generally recommend treating sweet corn that has green silks when we catch 10 moths per night, so our catches are 35-45 times higher than the threshold. What does that mean? To me it means that if you have sweet corn that has green silks, you should be spraying every other day with the high rate of your best insecticide (Capture, Warrior, Mustang Max), and you may want to add some PennCap M to the spray tank to increase your kill of adult moths. As I like to say, anyone can control insects in sweet corn in June and July, but when we start getting moth flights like this in August and September, then we find out who knows what they are doing. When the pressure is this high, you should also make sure your sprayer is calibrated properly, clean all your nozzles tips are clear and putting out the right amount of spray, made sure that you are getting insecticide on the silks where you need it, and made sure that your spray water pH is correct. Even if you do

everything right, you may still see some damage when pressure is this high, but you should do everything you can to avoid a crop failure.

Tomato and pepper growers should also be aware of the potential form earworm (fruitworm) damage. This can be a particular problem if your tomato or pepper fields are surrounded by corn fields that are drying down and are no longer attractive to corn earworm moths for egg laying. Growers should tighten their insecticide spray schedules to at least once per week to avoid economic losses.

HARVEST PERIOD DISEASE MANAGEMENT - (*Dan Egel*)

- Consider the following disease management items as you harvest your vegetables this season:

- For the most part, fungicide applications are unnecessary 2 to 3 weeks from the final harvest. This is because the residue from most fungicides will last for 10 to 14 days and the amount of time it takes for disease to develop makes it unlikely yield loss will result during the final 2 to 3 weeks.
- Identify any disease problems you find on the fruit this year so that the problem can be avoided next year. Contact Dan Egel or the Plant and Pest Diagnostic Laboratory on campus.
- Inspect fruit for disease so that problems do not develop in shipment.
- Do not harvest seed from fruit grown in fields with disease. Many disease organisms may be transmitted from seed to seedling, thereby assuring that the problems will show up next year.
- As soon as possible after the last harvest, plow under the crop residue. This will start the decay process and slow the spread of any disease from this field to adjacent fields.

EARLY MATURING PUMPKINS - (*Liz Maynard*) - It's not uncommon to see pumpkins turning orange in August, but this year, reports suggest there may be more early-maturing pumpkins than usual. If that's true, what might explain it? And is it better to cut the pumpkins now or leave them in the field? Once pumpkins are cut, how should they be stored?

The time from seeding to the first orange pumpkin depends on 1) the time from planting to fruit set, and 2) time from fruit set to maturity. In Northern Indiana, the first female pumpkin flowers usually open about 5 weeks after seeding. If pollinators are present and environmental conditions favorable, the first fruit is set at that time. High temperatures can delay opening of the first female flower, particularly in heat-sensitive varieties, and cool temperatures may hasten it. This year, temperatures were favorable for flowering and fruit set in late June and the first half of July across much of Indiana; if dry conditions didn't prevent fruit set, probably many pumpkin plantings set fruit during that period.



Figure 1: Pumpkin 3 weeks after fruit set showing beginnings of orange color in background. (Photo by E. Maynard)



Figure 2: Pumpkin 4 to 5 weeks after fruit set is mostly orange, but green 'netting' is still present on portions of fruit less exposed to sun. (Photo by E. Maynard)



Figure 3: Pumpkin 6 to 7 weeks after fruit set is completely orange. (Photo by E. Maynard)

Pumpkins may begin to turn orange 3 to 4 weeks after fruit is set (Figure 1), by 4 to 5 weeks after fruit set they may appear mostly orange (Figure 2), and by 6 to 7 weeks all traces of green can be gone (Figure 3). That means that fruit set in early July can be orange by late August. Under stressful environmental conditions, like the dry weather this year, there may be only one pumpkin per plant. For pumpkin plantings with a single fruit set in the first part of July, it wouldn't be surprising to see nearly all orange pumpkins by the end of August. In fields not so stressed, which have more than one pumpkin on a plant, there should be a mix of orange and green pumpkins in late August.

This year, the size of pumpkin vines could also be influencing what we see. The amount of vine growth can influence our perception of pumpkin maturity, as well as the actual development of orange color. In fields with less foliage, it is just plain easier to see the orange pumpkins because they are not covered by leaves. This year, smaller-than-normal vines would be expected given the dry conditions over much of the state, so this might explain some of what we are noticing. In addition, pumpkin fruit exposed to the sun is warmed by the sun and may develop orange color more quickly.

Will pumpkins that are orange now keep in the field until they are sold? That depends on a number of factors (in addition to when they are sold). First is the health of the plant. Pumpkins attached to vines with healthy stems and leaves are more likely to remain in good condition. Related to this is the amount of foliage covering the pumpkins: pumpkins protected from hot sun by leaves will tend to last longer. In some areas of the state, recent storms have damaged vines and rolled pumpkins around; orange pumpkins in these fields may not last as long. The condition of the pumpkin fruit itself is a factor. Fruit that has fresh injury from insect feeding or hail, or has disease lesions, is less likely to remain sound. Soil conditions are also very important. Wet, poorly drained soils provide conditions favorable for fruit rots. In fields with a history of soilborne disease, these conditions practically guarantee that fruit rots will occur. Weather conditions will also influence how long pumpkins retain quality. High temperatures will accelerate breakdown of mature pumpkins. Temperatures below 50°F contribute to chilling injury.

Whenever pumpkins are harvested, care during cutting, handling and storage will improve their shelf life. Decay is the main cause of losses during storage, and any injury to the pumpkin rind provides an opening for infection by decay organisms. Cut healthy fruit from the vine with a sharp blade or loppers. Brush off any soil that sticks to the pumpkin. Carry the pumpkin like a ball, not by the stem or 'handle.' Pumpkins may be windrowed in the field for later loading into bins, trucks or wagons, and transport to storage or market. Take care when loading pumpkins not to damage the rind of one with the stem of another. The sooner that cut pumpkins can be moved out of the field into more protected storage, the better quality they will retain,

especially if weather conditions are unfavorable (hot, cool, or wet). Away from the field, a shaded storage area protected from rain is desirable. Pumpkins should be placed on pallets or other materials to raise them off the ground or floor. If possible, avoid stacking to minimize damage. If feasible, be prepared to protect pumpkins from cool temperatures (below 45°) or frost by covering with a tarp or plastic, or moving to a more protected location. Ideal conditions for storage are 50-55 °F and 50-70% relative humidity. High ethylene levels will speed pumpkin breakdown and so pumpkins should not be stored with apples or other ethylene-producing fruit. Sound pumpkins stored under ideal conditions should last 2 to 3 months (Figure 4).



Figure 4: Many pumpkins harvested Fall 2002 and stored on pallets in an unheated barn were still in acceptable condition in January 2003. (Photo by E. Maynard)

References:

Brecht, J.K. 2004. Pumpkins and Winter Squash. *in* Gross, K.C., C.Y. Wang, and M. Saltveit, eds. *The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks*, Agriculture Handbook Number 66, DRAFT. USDA, ARS, Beltsville, MD. Online at <<http://usna.usda.gov/hb66/contents.html>> Accessed 8-21-07.

Riggs, D.I.M. and R. Rouse. 2003. Harvest and Post-harvest Handling. pp. 90-93 *in* Riggs, D.I.M, ed., *Pumpkin Production Guide*. NRAES-123. NRAES, Ithaca, NY.



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NCR SARE FARMER/RANCHER GRANT PROGRAM - (Rick Foster) - The North Central Region Sustainable Agriculture Research and Education Program has announced the call for proposals for their Farmer/Rancher Grant Program. Details are available at <<http://ncr.sare.org/prod/htm>>. This program is available for producers to receive up to \$6000 for an individual or up to \$18,000 for groups of three or more independent producers for research, demonstration, and educational programs on their farms. Search the website to find examples of successful topics that have been funded in the past. To assist growers in preparing their grant proposals, Purdue is joining together with Ohio State University and the University of Illinois to put on an IP Video workshop that will focus on successful grant writing, the details of the SARE Farmer/Rancher grant program, and tips from farmers who have successfully competed for these grants in the past. If you are interested in participating in this workshop, please contact your local county Extension educator and ask him/her to sign up for the broadcast. Each county Extension office has the capacity for hosting a site for this workshop. There is no charge to attend the workshop. In addition to my other duties, I serve as the SARE coordinator for Indiana, so please contact me if you have additional questions, (765) 494-9572; rfoster@purdue.edu.

FARM SUSTAINABILITY TOURS - (Jerry Nelson) - The remainder of The Indiana Farm Sustainability tours will be held from 10 a.m. to 3 p.m. the third Thursday of each month.

Future tour dates are listed below:

- * September 20; "Family Farming: Keeping the Family in the Family Farm"; Swiss Connection Cheese of Clay City and Moody Meats of Ladoga.
- * October 11; "Specialty-Marketing Partnerships"; Birky Family Farms, Valparaiso Farmers' Market and Crème de la Crop CSA, all of Valparaiso.
- * November 15; "Food Trends, a Look at Consumer Food Expectations and How We Can Meet Them"; Purdue Food Science facilities of West Lafayette.

For more information and to register, visit <www.conf.purdue.edu/farmtours>. Each tour is \$15 per person, which includes lunch, refreshments and materials. Individuals have the option to register for all of the tours or to select one or two at a time. Registration is due seven days prior to a tour.

The Purdue Small Farms Team, the Purdue New Ventures Team, Indiana State Department of Agriculture (ISDA) and the North Central Region Sustainable Agriculture Research and Education (NCRSARE) sponsor the 2007 Indiana Farm Sustainability Tours.

For questions and more information, please contact Jerry Nelson, New Ventures Extension educator and tour coordinator, at (812) 886-9582 or nelson@purdue.edu or Roy Ballard at (317) 462-1113 or rballard@purdue.edu.

Fruit and Vegetable Farmers and Market Gardeners Are Invited to:

Pumpkin & Sweet Corn
Twilight Meeting
Tuesday, September 11, 2007
at
Pinney Purdue Ag Center
Wanatah, IN

Located 5 1/2 miles East of Valparaiso or 1 mile West of Wanatah on
US Highway 30 then North 1/2 mile on Porter/LaPorte County Line Road

Purdue Extension brings you *Knowledge to Go* when and where you need it.

5:00 - 5:30 pm CDST Registration & Board Tour Wagons
5:30 - 7:30 pm CDST Tour Field Plots

- Synergistic and Supersweet Sweet Corn Varieties
- Sweet Corn Population Trial
- Pumpkin Varieties
- Weed Management in No-till Pumpkins
- Organic Zucchini

PARP Credit available

Extension Specialists Rick Foster, Rick Latin, Steve Weller, and Liz Maynard will discuss insect, disease and weed management, variety highlights, and production methods. Extension Educator Todd Hutson will discuss Protecting Water Supplies on the Farm.

7:30 - 8:30 pm CDST Catered Meal

==> Registration: \$5.00 [or \$15.00, with PARP credit] (payable at the meeting). Please register for the evening meal by September 6, 2007, by calling Liz Maynard at (219) 785-5673 or emailing her at emaynard@purdue.edu with name and number attending.

==> If you have a disability that requires assistance for your participation in this event, please contact Liz Maynard at (219) 785-5673 prior to the event. Pinney PAC is located at 11402 South County Line Road, Wanatah, IN 46390

==> Sponsored by Northwest Indiana Commercial Horticulture Program – Purdue University Department of Horticulture and Landscape Architecture, Purdue Agricultural Research Programs – Purdue Ag Centers, and Purdue University Cooperative Extension Service - LaPorte and Porter Counties.

==> More information and directions at www.agriculture.purdue.edu/pac/ppac/ or www.hort.purdue.edu/fruitveg/.

WE NEED YOUR SUGGESTIONS FOR WINTER MEETINGS

- (*Announcement*) - Purdue staff and grower associations are beginning to plan the program for the Indiana Horticultural Congress (Jan. 28 - 30, 2008), the Illiana Vegetable School (Jan. 3, 2008), and other winter meetings. Please help us with your suggestions for topics.

-What issues have come up this season that you'd like to hear more about?

-What new technologies, crops, or marketing strategies have you heard about that you'd like more information on?

-Have you heard an excellent speaker somewhere we should bring to Indiana?

-Is there a vegetable grower you'd like to hear talk about his/her operation?

Call, fax, or e-mail your suggestions. Thanks! Phone: (219) 785-5673 or (800) 872-1231 ext. 5673; Fax: (219) 785-5675; e-mail: emaynard@purdue.edu.

WILDLIFE SERVICES, NEW WEBSITE - (*Announcement*)

- There are two sections to this website. One section is for homeowners and agricultural producers. The other section is for professionals and businesses.

The website also has a Nuisance Wildlife Control Operator (NWCO) search. These people are the ones that will come out to your home or business to perform a variety of services. You are able to search for these people depending on county, pest, and a service you would like performed. The website is <www.wildlifehotline.info>.

GOOD-BYE CHRIS GUNTER - (*Announcement*) - Chris Gunter, Horticulture Specialist at the Southwest Purdue Ag Center announced he has taken another position and will be leaving Purdue University at the end of August. Chris's new position will be at North Carolina State University as a Vegetable Crop Specialist with Cruciferous and Solanaceous Crops. We will miss Chris professionally and personally. We wish Chris and his wife Ann-Marie the best in their new adventure.

Chris joined the SW Purdue Ag Center staff November 1, 2000. Prior to joining Purdue, Chris had completed a Ph.D. in 1996 at the University of Wisconsin-Madison working on the mineral nutrition of potatoes, also an M.S. in Horticulture in 1994. Chris has long connections to Indiana, having grown up in Elkart, IN. He received his B.S. degree in Horticulture at Purdue in 1989.

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